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SUBJECT: AGRICULTURAL AND NON-AGRICULTURAL TOTAL RELEASE FOGGER RELATED PESTICIDE ILLNESS CASES REPORTED TO THE PESTICIDE ILLNESS SURVEILLANCE PROGRAM AND EVALUATED AS ASSOCIATED TO PESTICIDE EXPOSURE, 2006-2010

I ran a query of the California Pesticide Illness Surveillance Program (PISP) Oracle database using Standard Query Language and extracted case episodes received by PISP from 2006- 2010 in which health effects were evaluated as definitely, probably, or possibly related to exposure to pesticide where the equipment code refers to a fogger.

The PISP data dictionary defines foggers as disposable pressurized cans designed for the total release of the contents in a single use, where the pesticide is propelled out of the can by an inert compressed gas propellant. This query excludes aerosol/fog-generating equipment, which refers to refillable machines designed to disperse airborne droplets in either confined spaces or outdoor areas.

New EPA labeling requirements for total release foggers aimed to reduce poor placement of foggers and to clarify unclear label precautions have taken effect as recently as September 2011 (see http://www.epa.gov/oppsrrd1/reevaluation/label-lang-fogger-letter.pdf). This memorandum summarizes fogger illness through calendar year 2010, the most recent PISP data available. The impact of the new label requirements on mitigating exposure to foggers will not be apparent until a review of 2012 and subsequent calendar year illnesses can be conducted.

Background

PISP receives reports of pesticide illness from Doctor's First Report of Occupational Illness and Injury, documents associated with California workers' compensation claims, as well as illness reported by California Poison Control System (CPCS). Some cases are also reported directly from medical professionals. Under California law, physicians are required to report any suspected case of pesticide-related illness or injury by telephone to the local health officer within 24 hours of examining the patient.

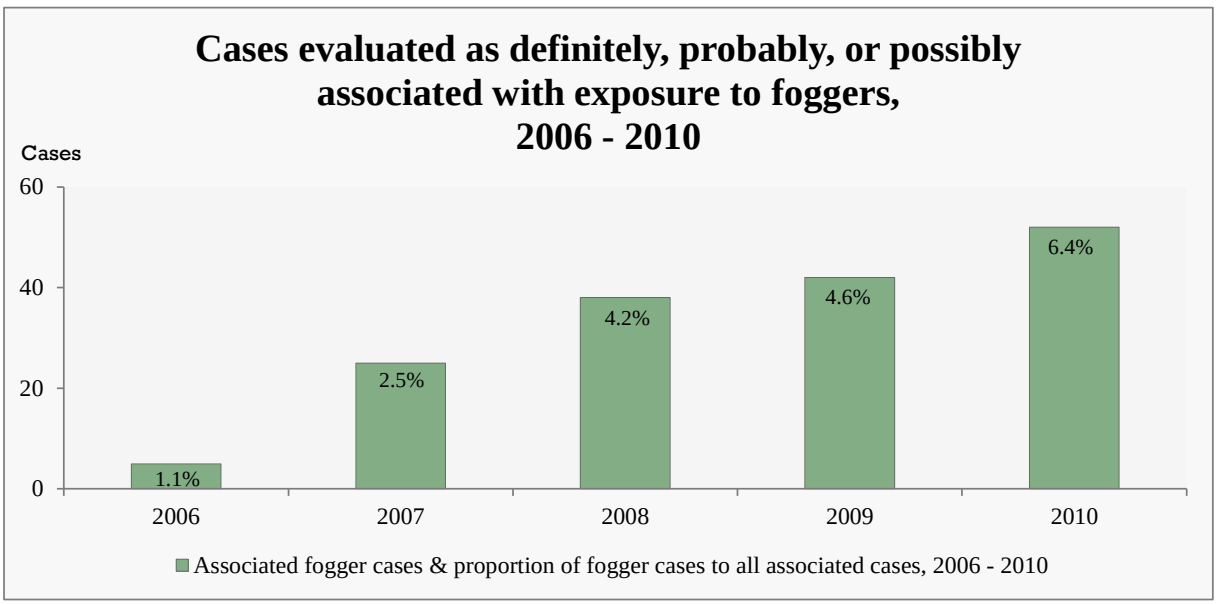
PISP scientists evaluate these initial reports and assign cases that meet program criteria for investigation to the County Agricultural Commissioner (CAC). CACs investigate identified pesticide

illnesses that occur in their jurisdictions. They attempt to locate and interview all people with knowledge of the exposure events, collect samples when useful, and review relevant records. When investigations are complete, CACs send reports to PISP describing their findings. PISP scientists evaluate medical reports and all information the CACs gather in the investigative process. They abstract and encode basic descriptors of the event, then undertake a complex synthesis of all available evidence to assess the likelihood that pesticide exposure caused the illness. Standards for the determination are described in the PISP program brochure, "Preventing Pesticide Illness," which can be viewed or downloaded from DPR's web site at http://www.cdpr.ca.gov/docs/whs/pisp/brochure.pdf .

An **associated case** is a record of one pesticide exposure and its apparent effects evaluated as definitely, probably, or possibly related to that exposure. A definite relationship indicates that both physical and medical evidence document exposure and consequent health effects. A probable relationship indicates that limited or circumstantial evidence supports a relationship to pesticide exposure. A possible relationship indicates that health effects correspond generally to the reported exposure, but evidence is not available to support a relationship. Cases classified as unlikely, indirect, asymptomatic, or unrelated were not included in the query. A **case episode** is an incident in which one or more people experience pesticide exposure from a particular source. A **priority** number is a code assigned to each case in an episode that meets priority criteria, which include: a. More than 5 persons were exposed; b. a person was admitted to a hospital, or; c. death occurred.

Summary

Pesticide illness cases involving foggers have increased from 2006 to 2010 both in number and as a proportion of associated cases per year. (It should be noted that 2006 was an anomalous year, when state budget cuts contributed to the fewest cases received in the history of the program.)



The query yielded a total 162 cases of fogger illness evaluated as definitely, probably, or possibly related to exposure, including seven multi-person episodes affecting 19 people. The largest number of persons involved in a single episode was five. None of the multi-person exposures resulted in hospitalization or disability. However, five single-person priority cases were investigated in which illnesses resulted in hospital admission ranging from 1 to 3 days.

	Occupational	**Non-Occupational**	**Unknown**	**Total**
Agricultural	1	0	0	1
Non-Agricultural	16	136	7	159
Unknown	0	0	2	2
Total	17	136	9	162

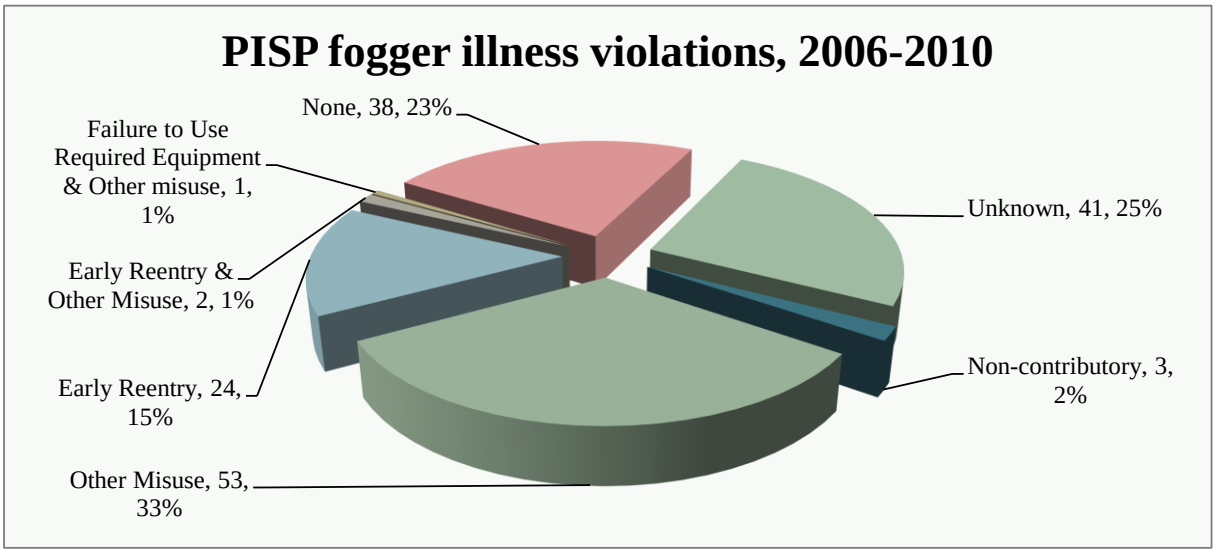
The majority of fogger cases were non-agricultural (161, 99%) and non-occupational (136, 84%) in nature. A designation as '**agricultural**' indicates exposure to pesticide intended to contribute to production of an agricultural commodity. Any other exposure situation is designated '**non-agricultural**'. **Occupational** illnesses are defined as those that occurred while the affected person was at work. Occupational status remained unknown in seven non-agricultural cases, and in two cases agricultural nor employment status could not be determined.

The age of patients ranged from 6 weeks to 85 years. Children under 18 comprised 26 (16%) of fogger illnesses and 6 cases were of an unknown age. Median age of cases was 40.

Residential settings were the most prominent location for exposure, accounting for 133 (82.1%) of the 162 associated illnesses. In fifteen illnesses the incident setting remained unknown.

Cases by symptoms recorded							
Respiratory		**Systemic**		**Skin**		**Eye**	
Respiratory only	Total Respiratory	Systemic Only	Total Systemic	Skin Only	Total Skin	Eye Only	Total Eye
45	127	20	94	5	14	2	24

Of the 162 associated cases, 72 reported symptoms associated with only one body system while the remainder reported symptoms affecting more than one body system. The most common illness classification was respiratory, such as coughing and shortness of breath, reported by 127 people (78.4% of cases), followed by systemic complaints including vomiting and nausea, reported by 94 (58% of cases).



Violation Type is a PISP database field identifying: failure to use required protective equipment when performing a task covered by law or regulation, early reentry, other misuse, and non-contributory violations (such as paperwork violations) alone or in combination with other types of violations. PISP violations are not necessarily equivalent to Enforcement Branch violations, and are based upon results of an investigation by CAC staff and review of product label.

Based on the information available at the time of evaluation, WHS scientists concluded that 80 (49.4%) cases provided evidence that violation of safety requirements had contributed to exposure, and harm might have been avoided if all the people involved had adhered strictly to safety procedures already required by regulations and pesticide labels. Whether violations occurred remained unknown after case investigation in 41 (25%) illnesses. In 38 (23%) cases, health effects were attributed to pesticide exposure in spite of apparent compliance with all applicable label instructions and safety regulations. Further evaluation of these cases is needed to determine if additional safety requirements are appropriate.

Active Ingredients & Products Implicated

Of the 162 associated illnesses involving foggers, the pesticide product was identified in 105 (64.8%) cases. Among actively registered foggers and those no longer registered, the following active ingredients were most commonly implicated:

Active ingredient identified	Single Active Ingredient	AI in combination with other pesticides	Total*
Cypermethrin	43	25	68
Permethrin	5	26	31
Pyrethrins	0	12	12
Tetramethrin	1	42	43
Lambda-cyhaloth	1	0	0
Esfenvalerate	0	5	5
DDVP	1	0	1
Pyriproxyfen	0	5	5
S-Methoprene	0	2	2
Triethylene glycc	0	2	2
Phenothrin	0	2	2
Unknown	51	4	55
Piperonyl Butoxi	0	20	20
Synergist	0	11	11

*Since multiple AIs often constitute a product, the total does not add to the total 162 cases.

Of the 105 cases with identified products, 80 cases involved products that are still currently registered, 23 referred to registrations that are no longer active, and 2 implicated multiple fogger products including currently registered and unregistered products.

The most commonly implicated total release foggers with currently active registrations are:

Current Active Products Implicated In PISP Fogger Illness Cases, 2006-2010	
41	Raid Concentrated Deep Reach Fogger (Cypermethrin)
13	Hot Shot Fogger 5 With Odor Neutralizer (Cypermethrin & Tetramethrin)
7	Hot Shot No-Mess! Fogger 3 With Odor Neutralizer
5	Raid Fumigator Fumigating Fogger
4	Hot Shot Bedbug & Flea Fogger
3	Real-Kill Indoor Fogger 5
2	Enforcer Four Hour Fogger Xx
1	Precor Plus Fogger
1	Prozap Beef & Dairy Rtu
1	Hartz Ultraguard Plus Home Fogger
1	Vet Kem Siphotrol Plus Fogger
1	1 Of 2 ACTIVE Cypermethrin Foggers (Partial Registration # Provided)
80	**Total**

Conclusion

A PISP query of total release fogger illnesses from 2006-2010 reflect an increase in cases over time, both in number and as a proportion of annual associated cases. Cases were predominantly non-occupational and non-agricultural, and occurred in residential settings. The majority of illnesses affected only one person; however, up to five people experienced illness in seven multi-person episodes. Products containing cypermethrin were most likely to be implicated in total release fogger illness, and Raid Concentrated Deep Reach Fogger was the product most often identified as an exposure source.

New EPA labeling requirements for total release foggers aimed to reduce poor placement of foggers and to clarify unclear label precautions have taken effect as recently as September 2011 (see http://www.epa.gov/oppsrrd1/reevaluation/label-lang-fogger-letter.pdf). The most current complete California pesticide illness data reflect incidents received in calendar year 2010. The impact of the new label requirements on mitigating exposure to foggers will not be apparent until a review of 2012 and subsequent calendar year illnesses can be conducted.